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United States Patent

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Date of Patent:**Aug. 10, 1999****[54] ADAPTIVE ANTENNA****[75] Inventors:** Hiroki Shoki; Manabu Mukai, both of Kawasaki; Toshihiko Yokoi, Sagamihara, all of Japan**[73] Assignee:** Kabushiki Kaisha Toshiba, Kawasaki, Japan**[21] Appl. No.:** 08/953,666**[22] Filed:** Oct. 17, 1997**[30] Foreign Application Priority Data**

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[51] Int. Cl.⁶ H01Q 3/22; H04Q 7/00**[52] U.S. Cl.** 342/373; 455/422; 370/339**[58] Field of Search** 342/373; 455/422, 455/33.3; 379/59; 370/339**[56] References Cited****U.S. PATENT DOCUMENTS**

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Primary Examiner—Mark Heilner**Attorney, Agent, or Firm**—Obilon, Spivak, McClelland, Maier & Neustadt, P.C.**[57]****ABSTRACT**

Features of an adaptive antenna are a controlling portion 11 as a method for detecting the communication amount of each beam and an antenna controlling portion 7 as a controlling method for controlling the pattern of each beam corresponding to information of the detected communication amount. In particular, an exciting weight of each antenna element is controlled corresponding to the detected communication amount and thereby the pattern of each beam is controlled. Thus, the communication amounts of individual beams can be flexibly well-balanced. Consequently, the communication capacity of the base station can be effectively used.

18 Claims, 9 Drawing Sheets